Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A background memory manager (BMM) for managing a memory in a data processing system, the BMM comprising:

circuitry ~~for transferring~~ to transfer a data ~~structures~~ structure to and from an outside device and to and from a memory; and

~~a memory state map associated with the memory; and~~

a communication ~~link to a processor;~~ link;

~~characterized in that the BMM manages the memory, determining~~ management logic coupled to a processor by the communication link and configured to determine if ~~each~~ the data structure fits into the memory, ~~deciding exactly where to place each data structure in~~ to decide where, in a plurality of regions in the memory, ~~performing all~~ to store the data structure, to perform data transfers between the outside device and the memory, ~~and~~ ~~maintaining the~~ to maintain a memory state map according to memory transactions made, and ~~informing~~ to inform the processor of new data and its location.

2. (Currently Amended) The BMM of claim ~~1~~ 1, wherein the ~~BMM, in storing a given data structure, provides~~ management logic is further configured to provide, for the data structure and when the data structure is stored, a data identifier ~~for the given data structure,~~ on the ~~link to the processor.~~ communication link.

3. (Currently Amended) The BMM of claim ~~2~~ 2, wherein the ~~BMM, in making~~ management

logic is further configured to update, in response to the memory transactions, ~~updates~~ the

memory state map to a new memory ~~state, keeping~~ state to keep track of regions occupied by

valid data and regions ~~not occupied~~ unoccupied by valid data.

4. (Currently Amended) The BMM of claim ~~2~~ 2, wherein the ~~BMM,~~ management logic is

further configured to copy, in response to a signal on the ~~processor~~ communication link that

the processor is finished with ~~certain~~ identified data in the memory, ~~copies~~ the identified data

from the ~~memory, if needed,~~ memory to another ~~device,~~ device and ~~updates~~ to update the

memory state map to indicate a new memory state for a region of the identified data ~~copied.~~

data.

5. (Currently Amended) The BMM of claim ~~1~~ 1, further comprising an interrupt handler

~~allowing~~ configured to allow a remote data source to interrupt the BMM when data is

available to be transferred to the memory.

6. (Currently Amended) The BMM of claim ~~1~~ 1, wherein data handled by the BMM

constitutes network data packets.

7. (Currently Amended) A data processing system, comprising:

    a processor;

    a memory coupled to the processor; and

a background memory manager (BMM) coupled to the memory and the processor, the ~~background memory manager~~ BMM including circuitry ~~for transferring~~ to transfer a data structure to and from an outside device and to and from the ~~memory, and a memory state map associated with the memory;~~

~~characterized in that the BMM manages the memory, determining~~ memory and including management logic configured to determine if ~~each~~ the data structure fits into the memory, ~~deciding exactly where to place the data structure in~~ to decide where, in a plurality of regions in the memory, ~~performing all~~ to store the data structure, to perform data transfers between the outside device and the memory, ~~and maintaining the~~ to maintain a memory state map according to memory transactions made, and ~~informing~~ to inform the processor of new data and its location.

8. (Currently Amended) The data processing system of claim ~~7~~ 7, wherein the ~~BMM, in storing a given data structure in the memory, provides~~ management logic is further configured to provide, for the data structure and when the data structure is stored, a data identifier ~~for the given data structure~~ to the processor.

9. (Currently Amended) The data processing system of claim ~~8~~ 8, wherein the ~~BMM, in making~~ management logic is further configured to update, in response to the memory transactions, ~~updates~~ the memory state map to a new memory ~~state, keeping~~ state to keep track of regions occupied by valid data and regions ~~not occupied~~ unoccupied by valid data.

10. (Currently Amended) The data processing system of claim ~~8~~ 8, wherein the ~~BMM,~~ management logic is further configured to copy, in response to a signal from the processor that the processor is finished with ~~certain~~ identified data in the memory, ~~copies~~ the identified ~~data, if necessary,~~ data from the memory to another ~~device,~~ device and ~~updates~~ to update the memory state map to indicate a new memory state for a region of the identified data ~~copied.~~ data.

11. (Currently Amended) The data processing system of claim ~~7~~ 7, further comprising an interrupt handler ~~allowing~~ configured to allow a remote data source to interrupt the BMM when data is available to be transferred to the memory.

12. (Currently Amended) The data processing system of claim ~~7~~ 7, wherein data handled by the BMM constitutes network data packets.

13. (Currently Amended) A network packet router, comprising:

an input/output (I/O) device ~~for receiving and sending packets~~ configured to receive and to send a packet on the network;

a processor;

a memory coupled to the processor; and

a background memory manager (BMM) coupled to the memory and the processor, the ~~background memory manager~~ BMM including circuitry ~~for transferring packets~~ configured to transfer the packet to and from the I/O device and to and from the ~~memory, and a memory state map associated with the memory;~~

—————————— characterized in that the BMM manages the memory, determining memory

and including management logic configured to determine if each data the packet fits into the

memory, deciding exactly where to place each data packet in to decide where, in a plurality

of regions in the memory, performing all to store the packet, to perform data transfers

between the outside I/O device and the memory, and maintaining the to maintain a memory

state map according to memory transactions made, and informing to inform the processor of

new data and its location.

14. (Currently Amended) The data router of claim 13 13, wherein the BMM, in the process

of storing a given packet into the memory, provides management logic is further configured

to provide, for the packet and when the packet is stored, a data identifier for the given packet

to the processor.

15. (Currently Amended) The data router of claim 14 14, wherein the BMM, in making

management logic is further configured to update, in response to the memory transactions,

updates the memory state map to a new memory state, keeping state to keep track of regions

occupied by valid packets and regions not occupied unoccupied by valid packets.

16. (Currently Amended) The data router of claim 14 14, wherein the BMM, management

logic is further configured to copy, in response to a signal that the processor is finished with a

first packet in the memory, copies the first packet, if necessary, packet from the memory to

the I/O device, device and updates to update the memory state map to indicate a new memory

state for a region of the first packet copied. packet.

17. (Currently Amended) The data router of claim ~~13~~ 13, further comprising an interrupt handler ~~allowing~~ configured to allow the I/O device to interrupt the BMM when packets are available to be transferred to the memory.

18. (Currently Amended) A method for managing a memory in a data processing system having a processor, the method comprising:

(a) transferring a data ~~structures~~ structure to and from an outside device and to and from the memory by circuitry in a background memory manager (BMM);

(b) determining by the BMM if ~~each~~ the data structure from the outside device will fit into available space in the memory;

(c) deciding by the BMM exactly ~~where~~ where, in a plurality of regions in the ~~memory~~ memory, to store ~~each~~ the data structure; and

(d) updating a memory state map ~~associated with the memory~~ in the BMM ~~each time~~ when a memory transaction is made.

19. (Currently Amended) The method of claim ~~18 wherein, in step (c), the BMM, in storing a given data structure into the memory, provides~~ 18, further comprising providing, for the data structure and when the data structure is stored, a data identifier ~~for the given data structure~~ on a link to the processor.

20. (Currently Amended) The method of claim ~~19 wherein the BMM, in step (b), in making memory transactions, updates the memory state map to a new memory state,~~ 19, further

comprising keeping track of regions occupied by valid data and regions ~~not occupied~~ unoccupied by valid data.

21. (Currently Amended) The method of claim ~~19 wherein, in step (a), the BMM,~~ 19, further comprising:

copying, in response to a signal that the processor is finished with ~~certain~~ identified data in the memory, ~~copies~~ the identified ~~data, if necessary,~~ data from the memory to another ~~device,~~ device; and

~~updates~~ updating the memory state map to indicate a new memory state for a region of the ~~data copied.~~ identified data.

22. (Currently Amended)   The method of claim ~~18~~ 18, further comprising ~~a step for~~ interrupting the BMM by the outside device when data is available to be transferred to the memory.

23. (Currently Amended) The method of claim ~~18~~ 18, wherein data handled by the BMM constitutes network data packets.

24. (Currently Amended) The method of claim ~~23~~ 23, wherein the network ~~is~~ data packets are conveyed on the Internet.

25. (New) The data router of claim 13, wherein the BMM is further characterized by being configured to notify the processor when enough of the packet is stored for the processor to begin to perform desired processing.